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Title: OFF-SITE SOURCE RECOVERY PROGRAM OVERVIEW

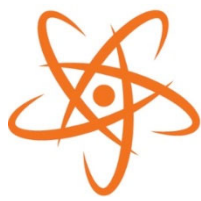
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Intended for: For OIG auditors, to provide an overview of our program

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ORS

Office of Radiological Security

Protect • Remove • Reduce

OFF-SITE SOURCE RECOVERY PROGRAM OVERVIEW

Justin Griffin

January 24, 2019



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- Radioactive sealed sources have been in general use for more than 100 years.
- Not all sources owned by licensees have a commercial disposal pathway.
- For over 20 years the OSRP mission has been to remove those unwanted radioactive sealed sources that pose a potential risk to national security, public health and safety.

OSRP does not recover powders, liquids, or loose/diffuse radioactive material. The program is limited to discrete sealed sources with rad material in solid form.



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OFF-SITE **SOURCE** RECOVERY PROGRAM

- Pre-1994: Need for end-of-life source management was identified and the Radioactive Source Recovery Program (RSRP) was conceived.
- The RSRP pilot project was initiated to test the process and ultimately implement a fully operational program.
- Early 1997: NRC prepared a list of 40 high priority neutron sources to be recovered by RSRP.
- August 1997: A final list of five sources at one facility was selected by NRC and provided to LANL.

OSRP Predecessor *RSRP* was established October 19, 1994.



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- 1997 RSRP pilot recovery operation demonstrated that such work can be done in a safe, effective, compliant, and cost-effective way.
- As a result of the success of RSRP, DOE combined it with three other DOE EM and Defense Program activities including LANL's Off-Site Waste program (OSW).
- DOE introduced the “Off-site Source Recovery Project” (OSRP) in a memo to the LANL Director on November 15, 1998.

Acronyms RSRP/OSW were combined into OSRP in order to signify the collective efforts of the predecessor groups and to highlight the “off-site” nature of the work.



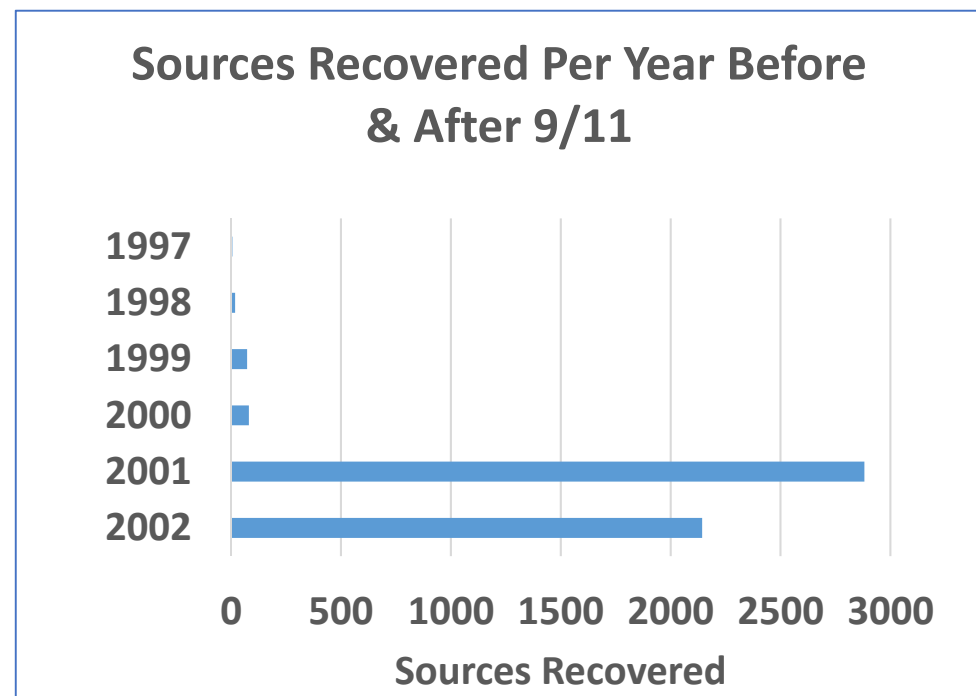
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The Influence of 9/11

- In the four-year period from Sept. 1997 to Sept. 2001, OSRP removed a total of just 1,599 sources.
- In the one year period from Sept. 11, 2001 to Sept. 11, 2002, OSRP successfully removed 2,667 radioactive sealed sources.
- 9/11 triggered a 500% increase in annual source recoveries.
- Since 2001, OSRP has continued to recover an average of about 2,100 disused sources each year.



- Sponsored by NA-212, Office of Radiological Security, OSRP brings in nearly \$17M in funding to LANL each year.
- OSRP provides assistance to many organizations.
- The OSRP team is made up of a dozen full-time experts in source recovery, source identification, packaging and transportation, health physics, radiation protection, and disposal.
- We maintain the only capability for disposal of sealed radioactive TRU sources at WIPP.

OSRP collaborates with other National Laboratories and commercial vendors for high-activity removals, Type B container operations, and waste certification.



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OFF-SITE **SOURCE** RECOVERY PROGRAM

OSRP Mission:

Over two decades of recovering excess, unwanted, abandoned, and orphaned radioactive sealed sources in the interest of national security and public health/safety.

- To date, OSRP has contributed to national and global security by removing more than 42,000 radioactive sources, totaling over 1.3 million Curies of material.
- OSRP has removed sources from all 50 states and 27 countries worldwide.

Isotope	Sources Recovered	Curies Recovered*
⁶⁰ Co	6,580	336,449
⁹⁰ Sr	303	640,567
¹³⁷ Cs	5,338	289,817
²³⁸ Pu	2,518	15,823
²³⁹ Pu	1,169	1,310
²⁴¹ Am	23,640	17,344
All Others	2,940	398
TOTALS	42,488	1,301,708

Data as of January 18, 2019

*Activity upon recovery

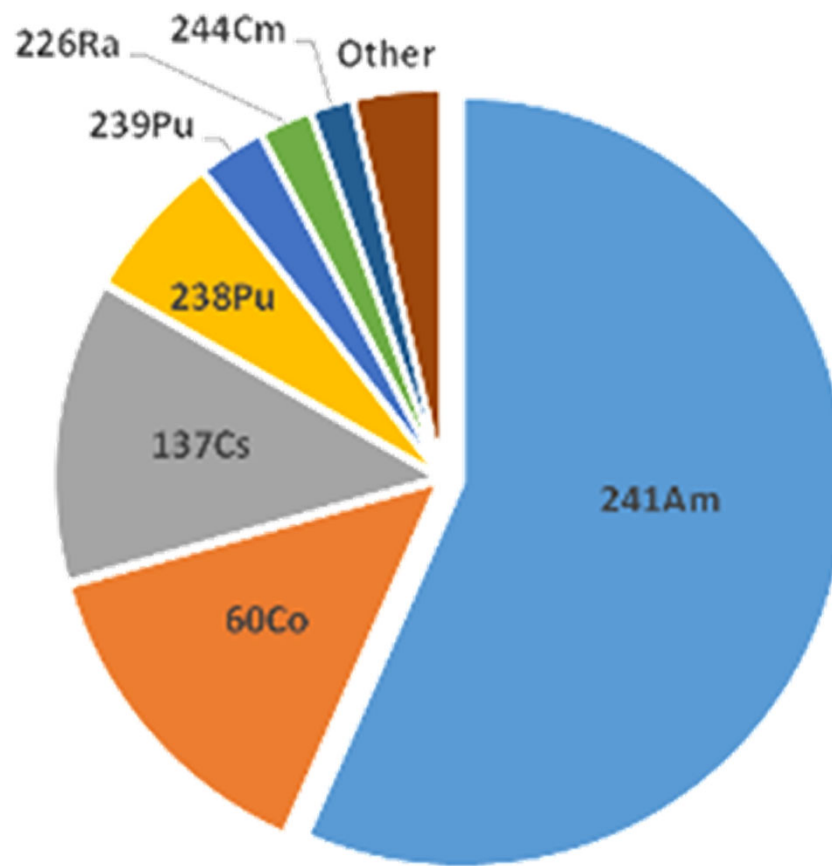
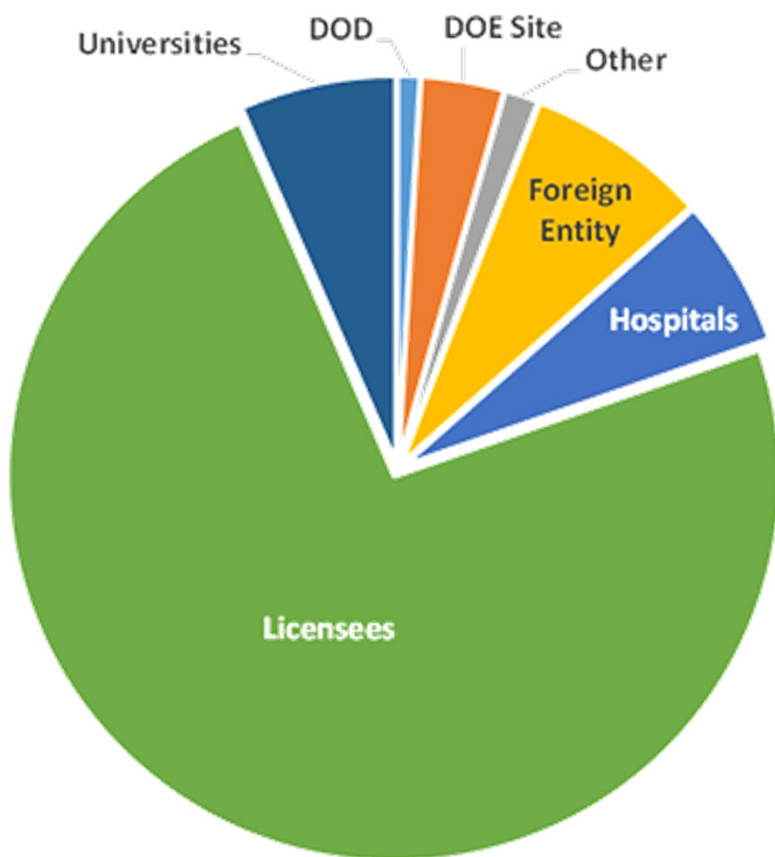


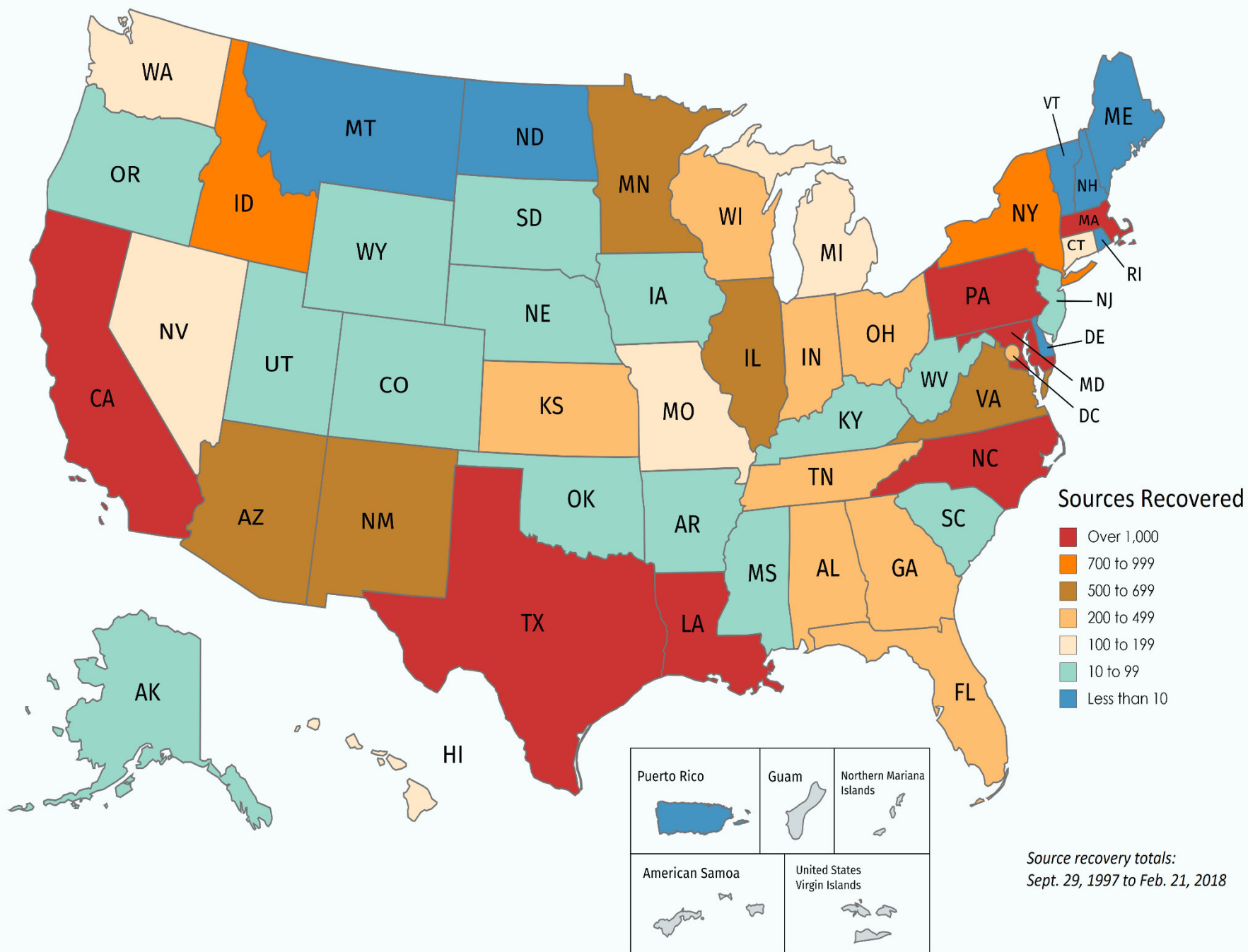
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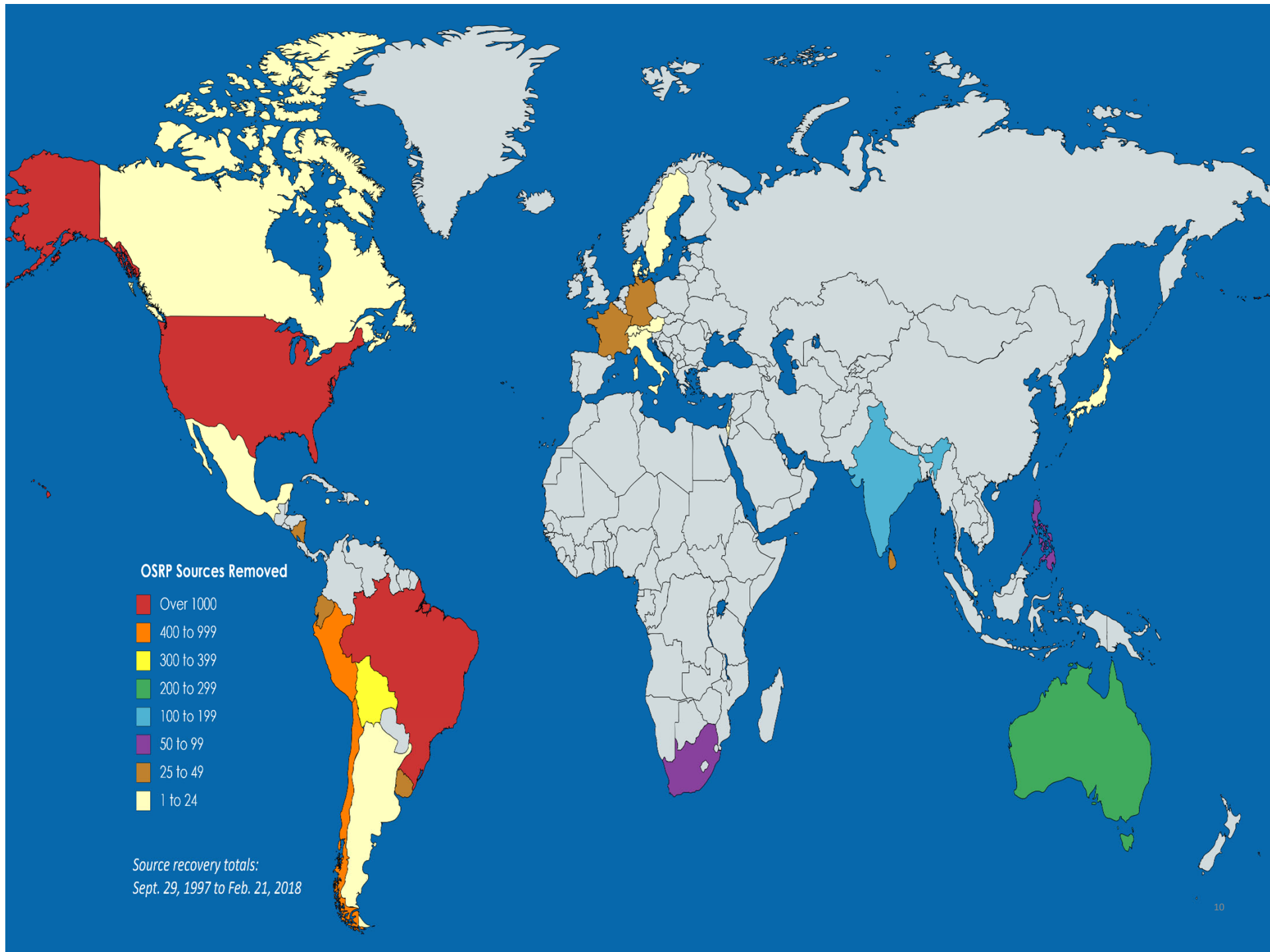


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Facility & Isotope Types

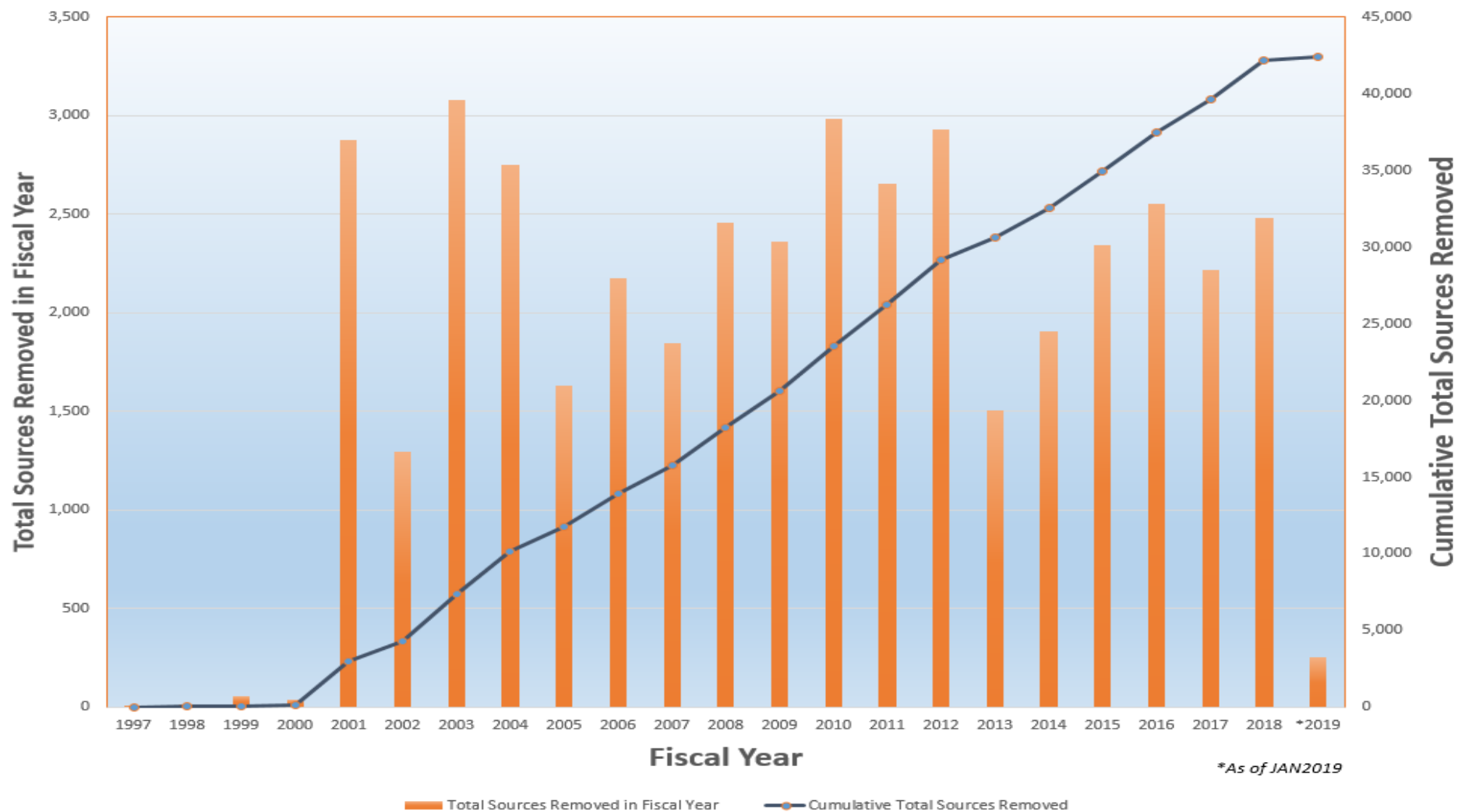






Recoveries Over the Years

OSRP Total Sources Removed Per Fiscal Year

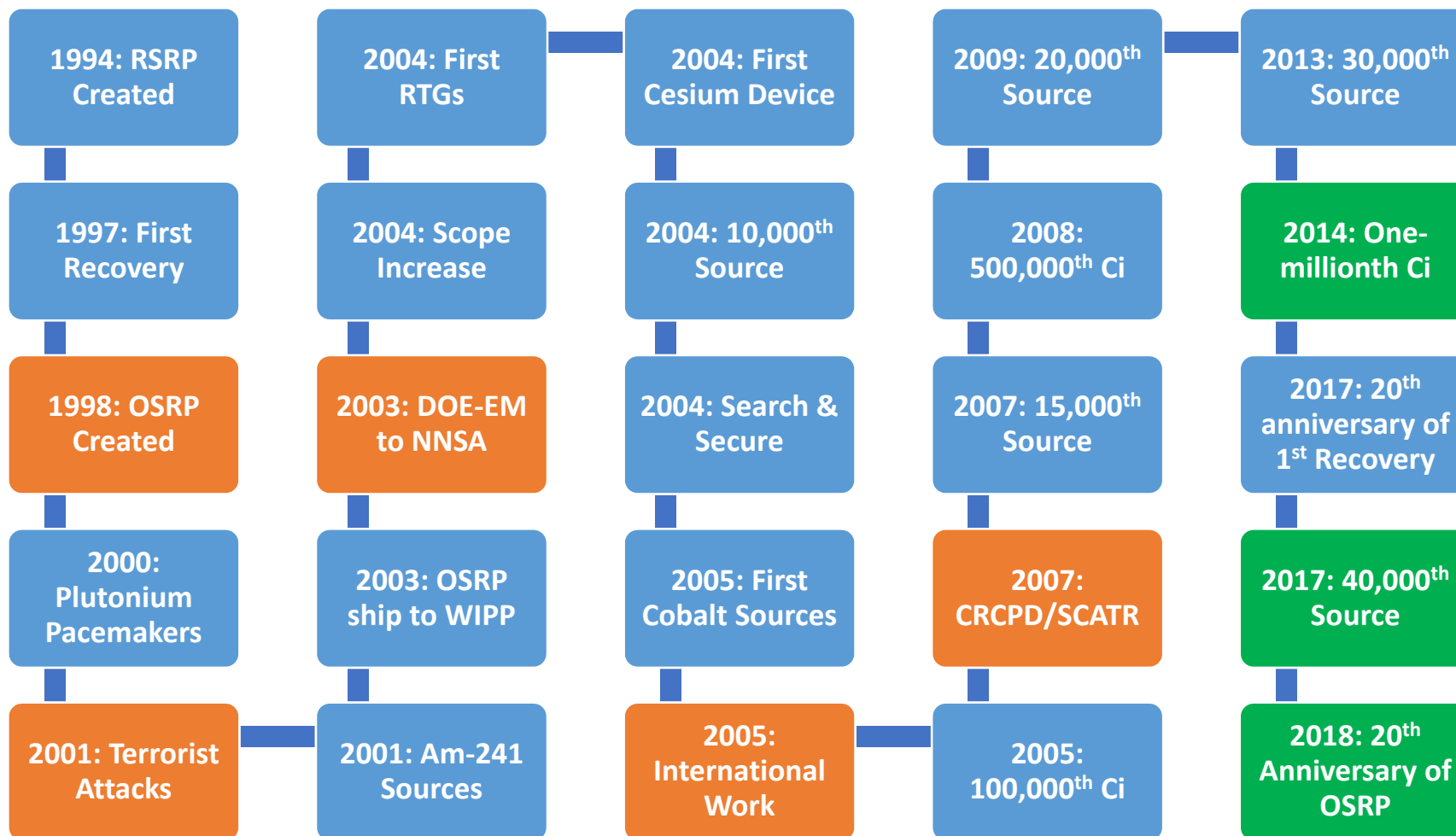


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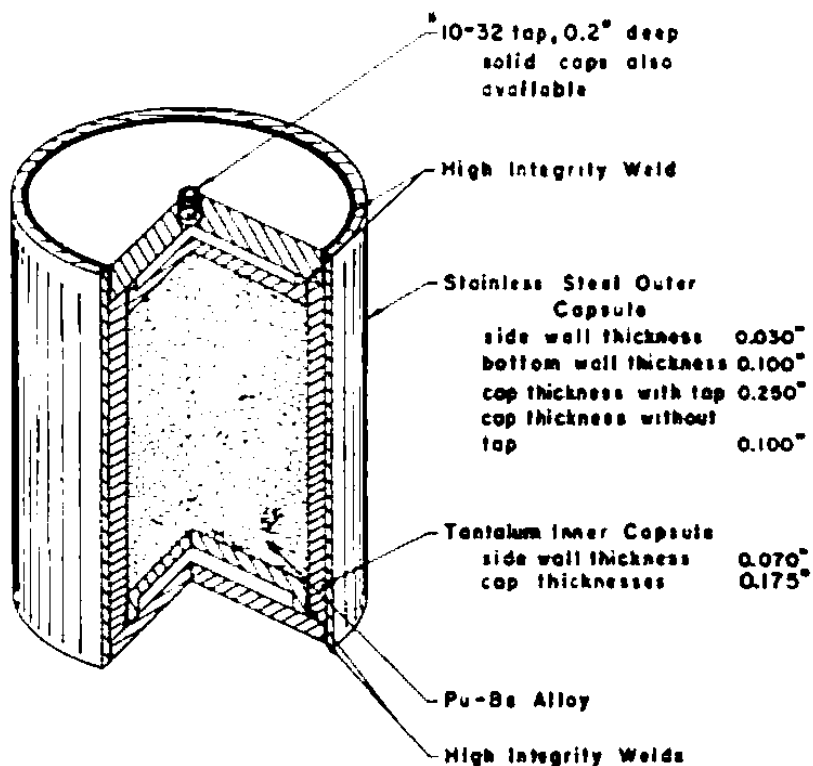


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A Long and Winding Road



Examples of Radioactive Sealed Sources



Standard NUMEC Plutonium-Beryllium Neutron Source



Examples of High-Activity Devices

- Blood and Research Self-Shielded Irradiators
 - Primarily Cs-137 and Co-60
 - Typically 4.81TBq (130Ci) to 148TBq (4,000Ci) decayed

Devices							
	<u>Gammacell 1000</u> Isotope: Cs137 Max Activity: 3,246Ci Weight: 3,000 lbs		<u>Gammacell 3000</u> Isotope: Cs137 Max Activity: 3,246Ci Weight: 3,500 lbs		<u>IBL 437C</u> Isotope: Cs137 Max Activity: 5,610Ci Weight: 4,450 lbs		<u>Gammacell 40</u> Isotope: Cs137 Max Activity: 4,200Ci Weight: 7,000 lbs
	<u>Gammacell 220</u> Isotope: Cs137 Max Activity: 26,400Ci Weight: 8,250 lbs		<u>J.L Shepherd 143</u> Isotope: Cs137 Max Activity: 3,300Ci Weight: 2,000 lbs		<u>J.L Shepherd Mark 1</u> Isotope: Cs137 Max Activity: 22,500Ci Weight: 3,000 lbs		<u>Theratron 780</u> Isotope: Co60 Max Activity: 13,400Ci Weight: 5,500 lbs

Basic Planning Requirements

- Source information – isotope/activity/photos/swipe tests
- Location – domestic/international, facility size
- Desired packaging configuration and staging location
- Number of personnel needed
- Logistics and timing
 - Tools
 - Equipment
 - Drums/Packaging
 - Site availability
 - Travel arrangements

The team does not operate as an emergency response source pick-up program, work is conducted off-site with extensive pre-planning.



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Transuranic Removal Operations

- Beyond LANL and the DOE/NNSA complex, sealed radioactive sources are used in several applications:
 - industrial devices (moisture-density, thickness gauges etc.),
 - medical devices (blood irradiators, radiotherapy, nuclear medicine),
 - research facilities,
 - universities,
 - nuclear power plants, etc.
- The team works with NRC and Agreement State licensed facilities such as private companies, universities, hospitals, and other governmental sites.
- For international missions, the team works with foreign source owners and directly with their in-country regulators as well.



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Commercial Vendor Responsible for Transportation

- Commercial vendor removes device from licensee facility and prepares it for shipment
- Commercial vendor is a registered user of a commercially available U.S. NRC-certified Type B container.
- Commercial vendor acts as shipper of record and is responsible for transportation security.
- Ownership transferred upon receipt at consolidation facility.



Nordion F-431
USA/9310/B(U)-96



NPI-20WC-6 MkII
USA/9215/B(U)-96

High Activity Removal Options

DOE National Laboratory Responsible for Transportation

- Commercial vendor removes device from licensee facility and prepares it for shipment
- DOE-owned and operated Type B container used for shipment.
- DOE-Lab acts as shipper of record and is responsible for transportation security.
- DOE-ownership is taken prior to the shipment.



435B
USA/9355/B(U)-96



CNS 10-160B
USA/9204/B(U)F-96

Work is Conducted Off-Site

- OSRP staff travel the world to successfully complete their mission.
- Off-site activities have been successfully completed at nuclear power plants, DOE and NNSA facilities, military bases, naval yards, commercial and industrial locations, and several foreign entities.
- Each location is different, so off-site work controls are each individually structured to implement controls commensurate with the nature of the radiological packaging activities performed—in collaboration with the sources owner/licensee.



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Questions?

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